Minor-2 (October 2014)

CHL133- Powder processing

(Answer all questions) time: 1 hr.

[List any assumptions made]

1. List twelve powder properties and explain each one of them briefly.

2. Explain selection and breakage distribution functions.

Explain their significance for ball mill and hammer mill for the following

a) balls size
b) number of Balls
c) ball weight
d) hammer size
e) hammer number
f) rpm of hammer

3.) Ball mill of diameter 2.3m with length 2.5 m is available. The feed size distribution shows that 80% is below 20mm .Pebbles of specific gravity 3300kg/cum and bulk density 3000Kg./cu.m has to be used as grinding media. Raw material of bulk density 1410 Kg/cu.m has to be crushed in the mill. The pebble size is 70 mm. Estimate the following:

a) Amount of balls to be added in tons for ball loading of 0.45
b) Amount of material to be used in tons for material loading of 0.945
c) Derive critical speed by making force balance on rotating ball with centrifugal force equal to gravity and estimate operating speed in rpm to run at 70% of critical speed

4) Write in 200 words your long problem with proper subtitles

5) What is angle of repose and Hausner ratio? How both are related.

6) Write short notes on the following:

a) Principle and operation of Jaw crusher

b) Principle of operation of Jet mill

c) Principle of operation of pin mill

d) Compare Ritinger's ,Bond's and kick's law